

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



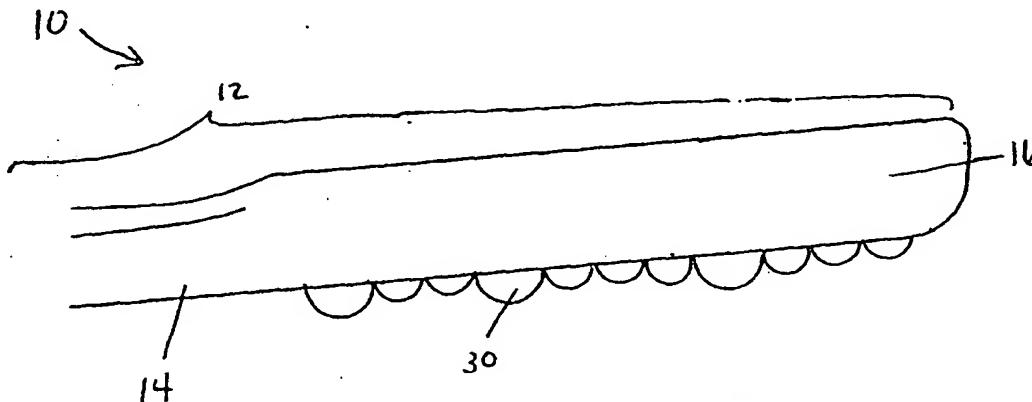
(43) International Publication Date
28 June 2001 (28.06.2001)

PCT

(10) International Publication Number
WO 01/45573 A1

- (51) International Patent Classification⁷: **A61B 17/24, A46B 15/00**
- (21) International Application Number: **PCT/US99/30628**
- (22) International Filing Date:
22 December 1999 (22.12.1999)
- (25) Filing Language: **English**
- (26) Publication Language: **English**
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- (81) Designated States (*national*): AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).
- Published:
— With international search report.
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **TONGUE CLEANING DEVICE**



(57) Abstract: Disclosed is a tongue cleaning device comprising a body having a handle and at one end thereof a head provided with a plurality of convex extrusions on at least one side of the head. Also disclosed is a tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with at least one raised ridge. Also disclosed is a device wherein the head is further provided with tooth-cleaning bristles on the side of the head that is opposite to the side that is provided with the convex extrusions or with the at least one raised ridge. Still further disclosed is a tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with tooth-cleaning bristles extending from the head on one side of the head, the tooth cleaning bristles further extending through the head to a height of up to about 7 mm on the opposite side of the head to form extension bristles for tongue cleaning.

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TONGUE CLEANING DEVICE

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FIELD

The present invention relates to a tongue cleaning device. More specifically, it relates to a device comprising a handle and a head provided on at least one side with convex extrusions, raised ridges, extension bristles, or any combination of these, that can be rubbed over the tongue surface to provide light scrubbing to open up the pores between the papillae of the tongue as well as to drive active ingredients from any oral care compositions that are used concurrently with the device into the recesses of the papillae, for preventing bad breath and providing breath freshness.

BACKGROUND

Oral malodor, commonly referred to as bad breath, is generally caused by digestive system problems, oral bacteria, diet, or a combination of any of these factors. Oral bacteria leads to the formation of plaque, which is the origin of dental caries, gingivitis, and dental calculus, as well as bad breath.

Such oral bacteria, which predominantly consist of anaerobic bacteria, accumulate in and on the tongue between the papillae of the tongue and upon decomposing, produce volatile sulfur compounds, i.e., bad breath. Scraping the tongue with a conventional tongue scraper can remove such tongue plaque; however, such scraping can easily harm the tips of the papillae of the tongue surface. Excessive scraping can even lead to bleeding and tissue damage. Therefore, it is apparent that conventional tongue scraping devices can cause pain and discomfort for the user. They may also be inconvenient, as they are generally provided as a separate device that may be included as a part of an oral

care regimen, e.g., a user might first brush the teeth using a toothbrush and a dentifrice, then use a separate tongue scraping device to clean the tongue.

Dentifrices and other oral care products such as mouthwashes may also be useful for combating bad breath. Such products operate to kill the breath odor causing bacteria by chemical means, e.g., anti-microbial agents such as triclosan, stannous fluoride, chlorhexidine, quaternary ammonium salts, and camphorated parachlorophenol, as opposed to a mechanical action such as is provided by the above-referenced tongue scraping devices. However, although such chemical products may improve breath quality immediately after brushing, they may not deliver long lasting benefits. In some cases they may cause undesirable side effects such as staining, altered taste sensation, etc.

Thus, there remains a need for a user-friendly, convenient and efficacious device for killing or retarding the growth and/or metabolism of the bad breath-causing bacteria that are present in and on the tongue, and for removing the tongue plaque. None of the existing art provides all of the advantages and benefits of the present invention.

SUMMARY

The present invention relates to a tongue cleaning device comprising a body having a handle and at one end thereof a head provided with a plurality of convex extrusions on at least one side of the head. Also disclosed is a tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with at least one raised ridge. Also disclosed is a device wherein the head is further provided with tooth-cleaning bristles on the side of the head that is opposite to the side that is provided with the convex extrusions or with the at least one raised ridge. Still further disclosed is a tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with tooth-cleaning bristles extending from the head on one side of the head, the tooth cleaning bristles further extending through the head to a height of up to about 7 mm on the opposite side of the head to form extension bristles for tongue cleaning.

These and other features, aspects, and advantages of the invention will become evident to those skilled in the art from a reading of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims particularly pointing out and distinctly claiming the invention, it is believed that the present invention will be better understood from the following description of preferred embodiments taken in conjunction with the accompanying drawings in which:

Fig. 1 is an enlarged side view of a portion of a preferred embodiment of the tongue cleaning device of the present invention;

Figs. 1a and 1b are detailed views of the convex extrusions shown in Fig. 1;

Fig. 2 is a perspective view of another preferred embodiment of the present invention;

Fig. 3 is a side view of the device shown in Fig. 2;

Fig. 4 is schematic drawing illustrating an enlarged view of a portion of a preferred embodiment of the present invention and an enlarged view of a portion the tongue, showing the effect of a device of the present invention when it is used in combination with an oral care composition such as a dentifrice;

Fig. 5 is a perspective view of another preferred embodiment of the device of the present invention;

Fig. 6 is an enlarged, perspective view of a portion of the device shown in Fig. 5; and

Fig. 7 is an enlarged side view of a portion of yet another preferred embodiment of the device of the present invention.

DETAILED DESCRIPTION

A preferred embodiment of the device of the present invention is shown in partial enlarged view in Fig. 1. The device 10 is comprised of a one-piece body 12 comprised of a handle 14 (not fully shown) and a head 16. One side of the head 16 is provided with plurality of convex extrusions 30. In the embodiment shown in Fig. 1, the extrusions 30 are preferably of a rounded or domed shape having a diameter and a height as measured from the surface of the head of from about 0.1 mm to about 5 mm; more preferably from about 0.5 mm to about 3 mm. Examples of such rounded extrusions are more clearly shown in Figs. 1a and 1b. Without being bound by theory, it is believed that this size range is best compatible with the tongue papillae for enhanced cleaning and bacteria retardation/killing effect.

It is not necessary that all of the extrusions 30 be of identical dimension; rather, the sizes of each extrusion can vary on the same device. The extrusions 30 can be patterned on the head surface in any manner, for example, in rows, at random, or to make a desired shape. In addition, taking the size of the head 16 area of the device into consideration, any number of extrusions can be provided.

Preferably, the device 10 can also function as a toothbrush. In such embodiments, tooth-cleaning bristles 18 are also provided, on the side of the head 16 that is opposite the extrusions 30, as shown in Figs. 2 and 3.

Referring to Figs. 2 and 3, as is common in toothbrushes that are currently available, a neck 20 is located between the handle 14 and the head 16. The neck 20 is usually of a smaller cross sectional area than the handle or the head. The handle may also be provided with a non-slip grip area(s) 22 made from any suitable material known in the art including santoprene. The tooth-cleaning bristles 18 may be provided in any configuration, including configurations having three-dimensional profiles (not shown in the Figures) and/or varying degrees of hardness or stiffness, as is known to those of skill in the art.

Preferably, the tongue cleaning device 10 is integrated with a bristle-containing head, as shown in Figs. 2 and 3 and also in Figs. 5-7. Such embodiments provide added convenience for the user of the device, because the user can first use the tooth cleaning bristle-containing side as a toothbrush would normally be used, then turn the device over to rub the extrusion-containing side over the tongue to obtain the tongue cleaning effect.

Preferably, the tongue cleaning is performed after brushing, while the dentifrice or other oral care composition that has been used for brushing is still in the mouth, i.e., before rinsing. Without being bound by theory, it is believed that an efficacious breath freshening effect may be obtained when the device is used in this manner. The user brushes the teeth with the bristles and a dentifrice or other oral care composition. Then, before rinsing away the residual dentifrice or other composition that remains in the mouth, the user rubs the tongue cleaning device (using the side of the head that is opposite from the tooth-cleaning bristles) over the tongue surface. This action drives the active ingredients contained in the dentifrice further down into the recesses of the papillae, which kills or retards the growth or metabolism of the bacteria, predominantly anaerobic bacteria, that are present there and that can lead to bad breath.

This action is schematically represented in enlarged, simplified view in Fig. 4, where one extrusion 30 is shown being rubbed over the surface of the tongue 50 in the direction of the arrows labeled "A". The tongue is generally made up of many papillae 52 with recesses 54 located between the papillae 52. Anaerobic bacteria 56 tend to collect in the recesses 54, leading to bad breath. The oral care composition 60 is pushed down into the recesses 54 by the extrusions 30. Such action is believed to be particularly effective with oral care compositions containing antibacterial ingredients such as triclosan, chlorhexidine, polyphedid species, stannous salts, and zinc salts.

Although it is preferable to use the device 10 in combination with an oral care composition as described above, it should be noted that such is not required herein. Even without the use of an oral care composition, it is believed that when the device 10 is rubbed over the surface of the tongue 50, the convex extrusions 30 act to open up the pores or recesses 54 between the papillae 52 of the tongue, which can contribute to a cleaning/freshening effect.

Herein, it should also be understood that the tongue cleaning extrusions 30 need not be combined with a tooth cleaning, bristle-containing head, i.e., a toothbrush, as it can provide the benefits described herein without being incorporated as a part of a toothbrush, as shown in Fig. 1. In addition, it should be noted that a dentifrice or other oral care composition can be used with the tongue cleaning device 10, without first using the dentifrice or other composition to brush the teeth.

Techniques known to those of skill in the art, such as injection molding, can be used to manufacture the device 10 of the present invention. Any design, shape, or configuration for the handle 14 and/or the tooth cleaning bristles 18 is suitable herein. In addition, it should be understood that while the devices according to the present invention are particularly useful for human oral hygiene use, they can also be used for animal oral hygiene with equal advantage, e.g., for household pets or for veterinary usage.

For devices that also contain tooth-cleaning bristles 18, the head 16 is provided with holes (not shown) for receiving the bristles 18 or bundles of bristles 18, which are mechanically or thermally fixed therein, as is known to those of skill in the art. Any such method for fixing these bristles can be used herein.

Yet another exemplary preferred embodiment is shown in Figs. 5 and 6. In this embodiment, one or more extrusions in the shape of a raised ridge 35 are

provided alone or in combination with the convex extrusions 30. In such an embodiment, the user is provided with a different tongue feel than is provided by devices that are provided only with the convex extrusions. In addition, the raised ridge 35 provides light scraping that gives the sensation of cleaning to the user.

5 It should also be noted that it is equally possible to provide the raised ridges 35 alone, that is, without also providing the convex extrusions 30. In addition, although Figs. 5 and 6 illustrate two raised ridges 35, additional ridges or fewer ridges could be provided, as desired.

In yet another preferred embodiment of the present invention, the tongue
10 cleaning device is provided as a series of extension bristles 40 of the tooth cleaning bristles 18, in place of or in addition to the extrusions 30 and/or ridges 35. Such an embodiment is shown in Fig. 7. The extension bristles 40 protrude from the head to a height of from about 0.1 to 5 mm, with about 7 mm being the maximum desired height. In general, the extension bristles 40 are shorter than
15 the tooth cleaning bristles 18 that extend from the opposite side of the head.

In addition, the embodiment shown in Fig. 7 is advantageous in terms of manufacturing. During the tufting and looping operations that are generally performed when the tooth cleaning bristles 18 or bundles of tooth cleaning bristles 18 are inserted in the head, these bristles or bundles of bristles 18 are
20 pulled all the way through the head 16, instead of being fully contained at one end inside the head, as is the usually the case in toothbrush manufacturing. The protruding portions form the extension bristles 40 that are used for tongue cleaning. This is represented in Fig. 7 by the dashed lines showing the tooth-cleaning bristles 18 extending through the head to form the extension bristles 40.

25 The extension bristles 40 can then be flat cut to the desired height. Or, they can be profiled into domed shapes as shown.

EXAMPLES

In order to illustrate the benefits of the preferred embodiments of the
30 present invention, in the following Example, oral malodor reduction efficacy from tooth brushing alone versus tooth brushing in combination with tongue cleaning at 3 hours and at 7 hours after brushing is compared by conducting a Halimeter test according to the following procedure.

During the first leg of the test, the test participants brush the teeth only
35 with a dentifrice formulation (CREST Decay Prevention). During the second leg

of the test, the test participants brush the teeth with the same dentifrice formulation (CREST Decay Prevention), and also clean the tongue.

During both legs of the test, Halimeter readings are taken at baseline (0 hours), at 3 hours, and at 7 hours. No eating or drinking is allowed from baseline to 3 hours.

The Halimeter detects the presence of volatile sulfur compounds in the breath. The volatile sulfur compounds include hydrogen sulfide, methyl mercaptan, dimethylsulfide, ethylsulfide and dimethyldisulfide, all of which contribute to bad breath. Thus, the higher the Halimeter reading, the more breath malodor is present.

Each data point (value of Halimeter reading) below represents an average for all test participants using the same test composition at the same time (N= 17 for each test composition).

Table 1: Average Adjusted VSC Reading, Post Treatment (90% confidence interval in parentheses)

Treatment	Halimeter Reading vs. Time	
	3 hours	7 hours
CREST Decay Protection*/ Tooth Brushing Only	64.7 (52.1 - 80.2)	58.0 (50.6 - 66.5)
CREST Decay Protection*/ Tooth and Tongue Cleaning	47.6 (38.4 - 58.9)	43.9 (38.6 - 50.0)

* CREST Decay Prevention is a commercially available dentifrice product from the Procter & Gamble (China), Ltd. Company, 1 Bin He Road Guangzhou Economic & Technological Development District, Guangzhou P.R.C.

The foregoing example illustrates that VSCs are reduced by tongue cleaning according to the present invention. At 3 hours, the benefit provided by tongue cleaning is more clearly observed than at 7 hours. However, at 7 hours benefit continues to be provided.

Thus, the embodiments disclosed herein provide the advantages of breath malodor reduction for at least about 3 hours, with the sensation of cleaning

without damage or harm to the tongue being provided to the user. The preferred embodiments herein are also cost effective and easy to manufacture.

Herein, "comprising" means that other steps and other components which do not affect the end result can be added. This term encompasses the terms
5 "consisting of" and "consisting essentially of."

It is understood that the examples and embodiments described herein are for illustrative purposes only and that various modifications or changes in light thereof will be suggested to one of skill in the art without departing from the scope of the present invention.

WHAT IS CLAIMED IS:

1. A tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with a plurality of convex extrusions on at least one side of the head.
2. The device according to Claim 1 wherein the convex extrusions have a diameter and a height of from about 0.1 mm to about 5 mm.
3. The device according to Claim 2 wherein the convex extrusions have a diameter and a height of from about 0.5 mm to about 3 mm.
4. The device according to Claim 1 wherein the head is further provided with tooth-cleaning bristles on the side of the head that is opposite to the side that is provided with the convex extrusions.
5. A tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with at least one raised ridge.
6. The device according to Claim 5 wherein the head is further provided with tooth-cleaning bristles on the side of the head that is opposite to the side that is provided with the at least one raised ridge.
7. The device of Claim 6 further comprising a plurality of convex extrusions on the same side of the head upon which the at least one raised ridge is provided.
8. A tongue cleaning device comprised of a body having a handle and at one end thereof a head provided with tooth-cleaning bristles extending from the head on one side of the head, the tooth-cleaning bristles further extending through the head to a height of up to about 7 mm on the opposite side of the head to form extension bristles for tongue cleaning.
9. A method of cleaning the tongue of a human or an animal comprising the step of rubbing the convex extrusion containing side, the at least one raised

ridge containing side, or the extension bristle containing side of the head of the device of any of the preceding claims over the surface of the tongue.

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10. The method of Claim 9 further comprising the step of brushing the teeth with an oral care composition prior to the step of rubbing the extrusion-containing side, the at least one raised ridge containing side, or the extension bristle containing side of the head of the device over the surface of the tongue, wherein

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the oral care composition is pushed into pores of the tongue papillae.

FIG. 1

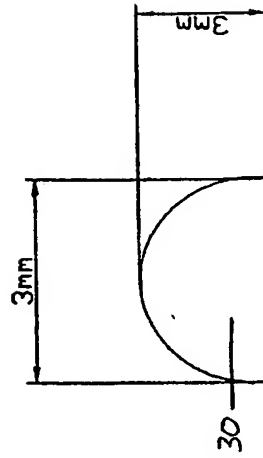
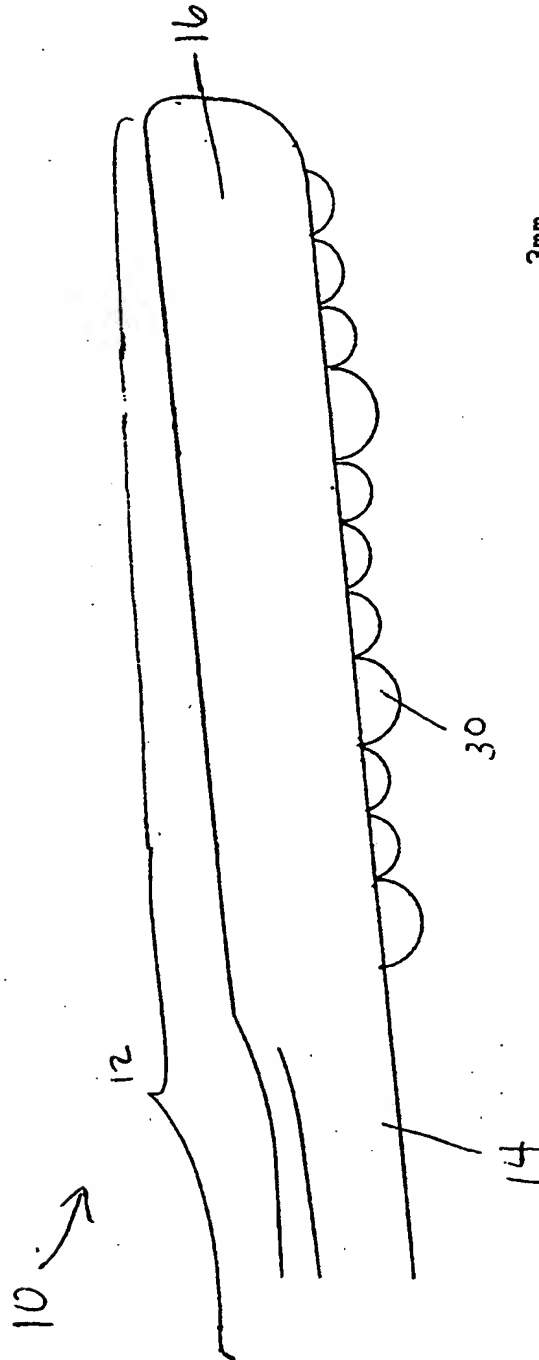


Fig. 1b

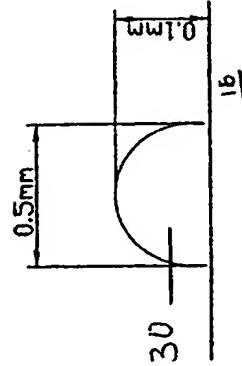
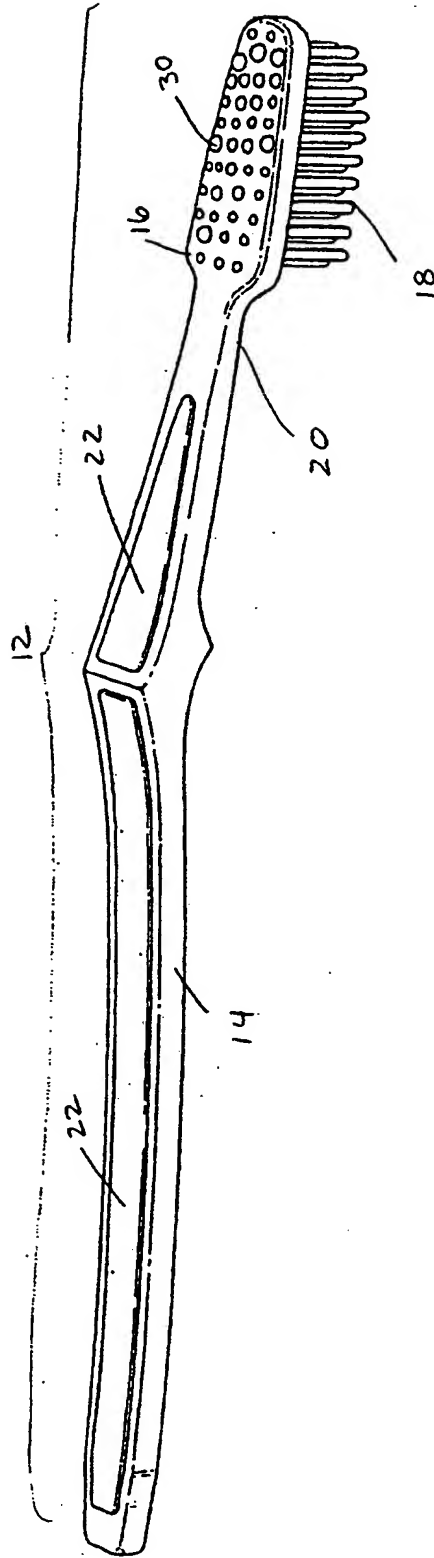


Fig. 1a

FIG. 2

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FIG. 3

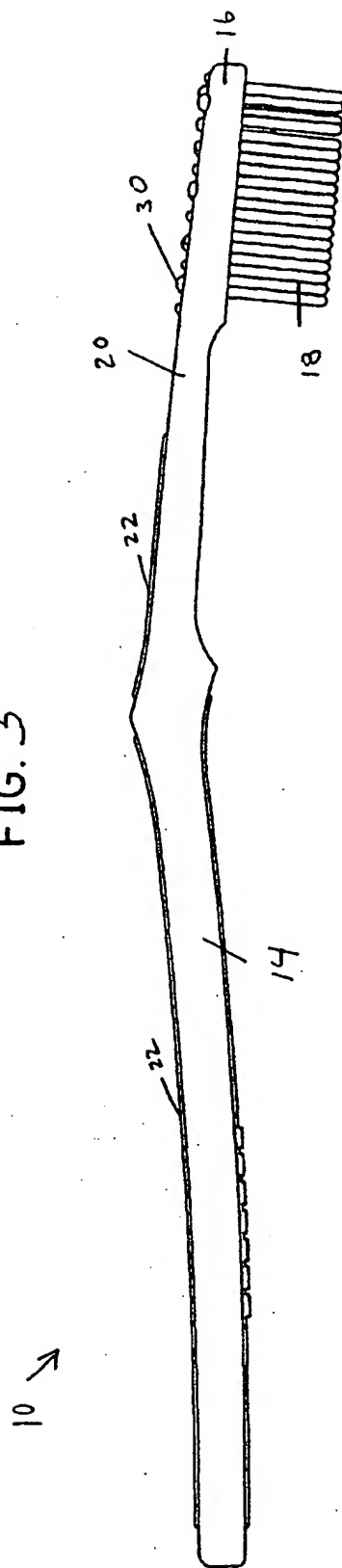
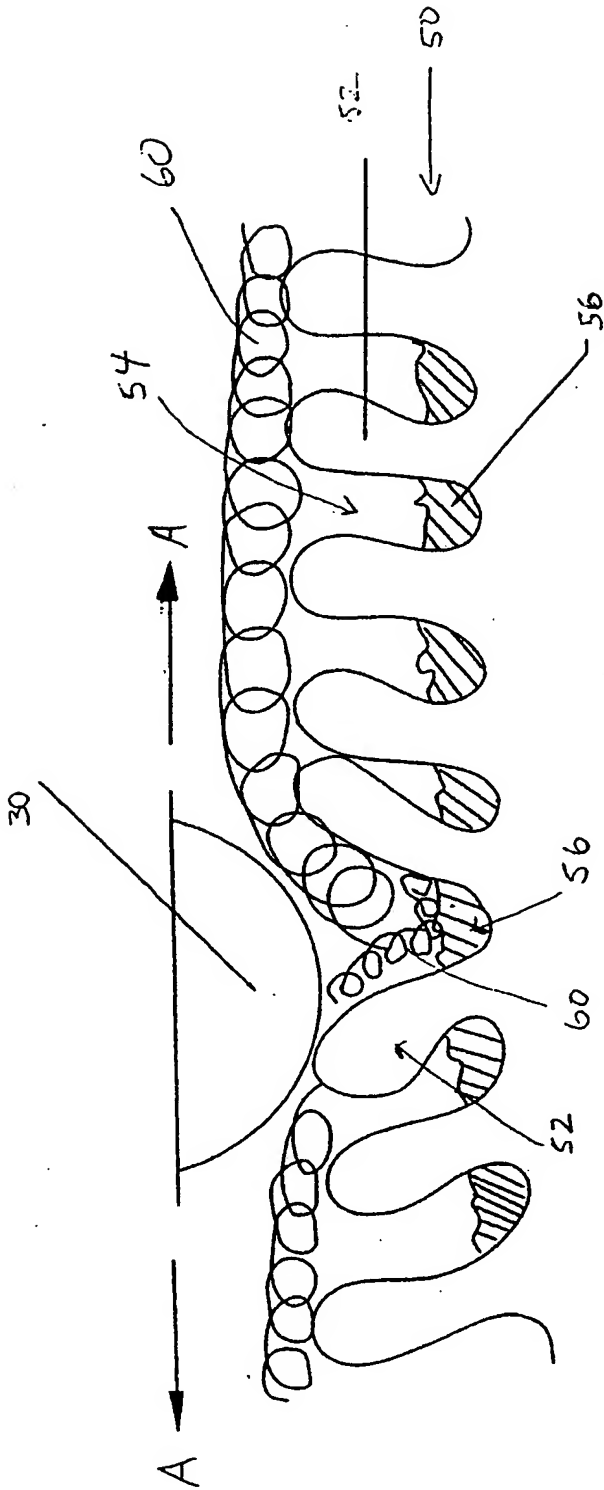


FIG. 4



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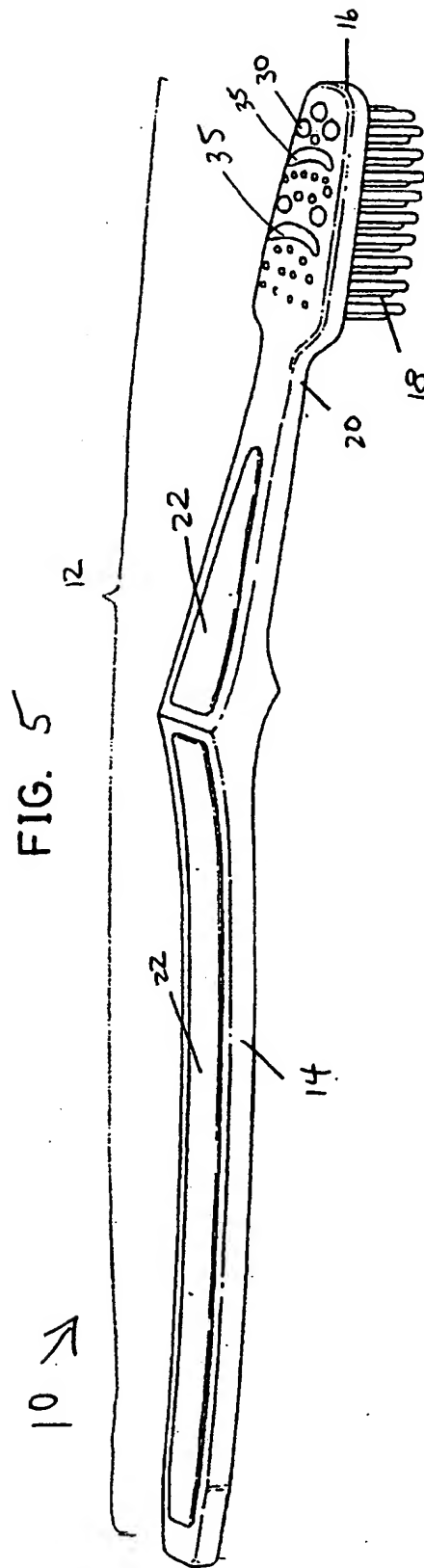
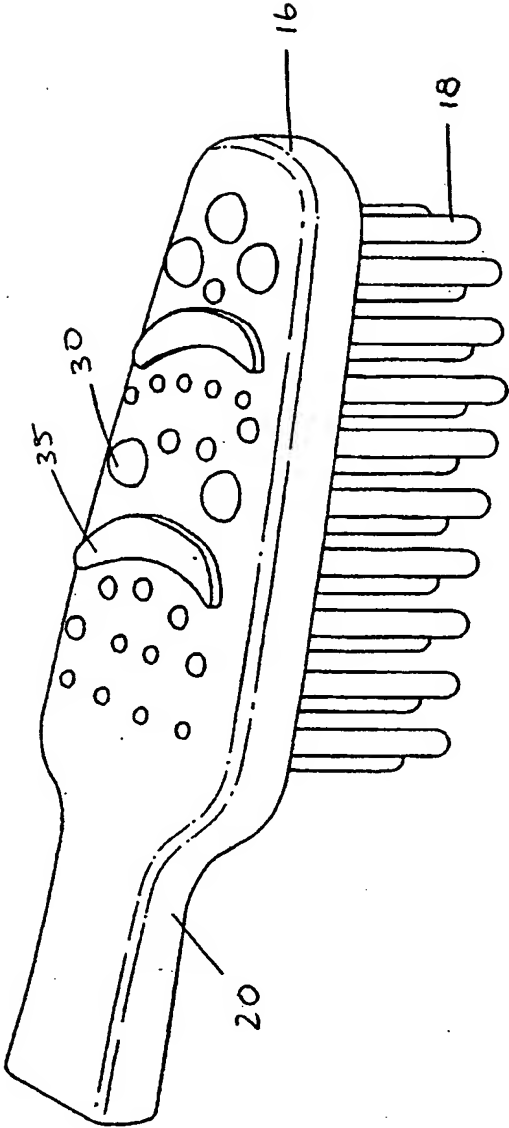


FIG. 6



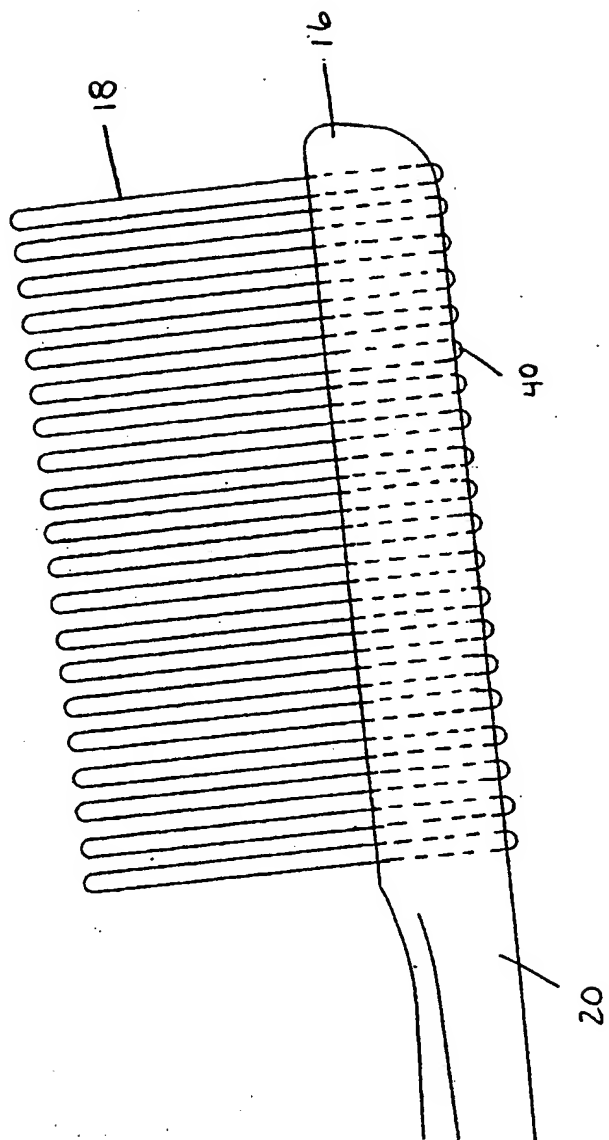


FIG. 7

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 99/30628

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B17/24 A46B15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B A46B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 810 856 A (TVERAS RIMVYDAS) 22 September 1998 (1998-09-22)	1-3,9,10
Y	column 5, line 48 -column 6, line 15; figures 1-4	4
X	US 5 792 159 A (AMIN JATIN N) 11 August 1998 (1998-08-11)	1-3,9,10
X	US 5 779 654 A (FOLEY PATRICK F ET AL) 14 July 1998 (1998-07-14)	1-3,9,10
X	FR 537 979 A (LOISON) 1 June 1922 (1922-06-01)	1-3
	page 1, line 31 - line 35; figure 1	
	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the International filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "A" document member of the same patent family

Date of the actual completion of the international search

25 August 2000

Date of mailing of the International search report

27 11 2000

Name and mailing address of the ISA

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MOERS, R

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/30628

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 032 082 A (HERRERA WILLIAM R) 16 July 1991 (1991-07-16) abstract; figures 1,2 ---	1
Y	DE 857 128 C (AXTMANN) figures 3,4 ---	4
A	WO 98 09573 A (MOELSTER OLAV) 12 March 1998 (1998-03-12) page 5, line 32 -page 6, line 3; figures 1-3 ---	1-3
A	US 5 766 193 A (MILLNER DON E) 16 June 1998 (1998-06-16) abstract; figures 1-3 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 99/30628

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-4, 9, 10

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4, 9 10

Tongue cleaning device having a head with a plurality of convex extrusions and method of use

2. Claims: 5-7

Tongue cleaning device having a head with at least one raised ridge

3. Claim : 8

Tongue cleaning device having a head with tooth-cleaning bristles extending on one side and tongue cleaning bristles extending on the other side

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/30628

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